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ABSTRACT

A study was conducted to determine: (1) the relationships between prior knowledge and passage recall; (2) the effect of a prereading activity (PReP) on available knowledge; and (3) the effect of the PReP activity on total comprehension scores. The subjects were 161 sixth grade students from a middle class suburban Long Island, New York, public school district, classified as high-, average-, or low-achieving readers. Two passages were selected from a sixth grade social studies text, from which three key words were chosen as memory probes for free association. Twenty multiple choice questions were prepared for each passage as comprehension criteria. The subjects were divided into four experimental conditions, with different combinations of free association, PReP, motivation, distractor, text, and questioning activities. Findings indicated that the PReP activity significantly raised the prior knowledge level, and may also have had some generalized effect on comprehension. This was particularly evident for the on-level group where the opportunity to "think through" relevant knowledge has the most effect on comprehension. (HTH)

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EFFECT OF ALTERED PRIOR KNOWLEDGE ON PASSAGE RECALL

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Background

This study was conducted to determine: 1) the relationships between prior knowledge and passage recall; 2) the effect of a pre-reading language and concept organizer activity (PReP) on available knowledge; and 3) the effect of the PReP activity on total comprehension score. This was done to determine not only whether the prior knowledge measure was a good predictor of "wh" comprehension, but also whether an activity which encouraged the subjects to become more aware of what they already knew about a topic (without direct concept instruction), would increase both

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the available prior knowledge and the actual comprehension score.

Langer (1980a) developed a text-specific prior knowledge measure based on key concepts dealt with in a specific text. Free association is used to elicit responses to stimulus words chosen from high in the content structure (Meyer, 1975) of the passage. The results of Langer's previous studies (Langer & Nicolich, 1980) have indicated a high relation between the level of prior knowledge and comprehension; the measure can therefore be considered a good predictor of recall. (The criterion measure in these studies was hierarchical content recall using Meyer's (1975) scheme.) One of the goals in this present study was to determine if the prior knowledge measure is also a good predictor of multiple choice "wh" comprehension.

Langer (1980b,c) has also developed a pre-reading activity which elaborates prior knowledge through a group activity focusing on the language and concepts which are central to the text. Pre-reading activities seem to fall into two broad categories: teacher directed and student centered. In teacher directed activities, teachers usually focus on the language, concepts, and/or organization they believe the students need to know before comprehending the text. Advance organizers (Ausubel, 1963; Ausubel & Robinson, 1969) and structured overviews (Barron, 1969; Barron & Earle, 1970; Herber, 1978) are examples of this type of activity. Student centered activities help students become aware of their existing knowledge and to link what they already know with the concepts presented in the text. ReQuest (Manzo, 1969), DRTA

(Stauffer,1970), self questioning (Andre & Anderson,1978), and prereading prediction (Herber,1978) are examples of this type of activity. The PReP activity, reported here, falls into the second category and is based on the assumption that students possess more relevant memory links and associations than are accessed in the usual classroom situation. The PReP consists of three phases: 1) initial associations with the concepts; 2) reflections on the initial associations; and 3) a refinement and reformulation of relevant knowledge.

The present study will examine the relation between the prior knowledge measure and "wh" comprehension, the effect of PReP on the free association responses, and the effect of PReP on "wh" comprehension.

METHOD

Subjects

The subjects for this investigation were 161 sixth graders from a middle class suburban Long Island, New York public school district. They were classified as high-, average-, or low-achieving readers based on the reading comprehension subtest scores of the Iowa Test of Basic Skills. IQ scores from the group administered Cognitive Abilities Test were available for 130 subjects.

Materials

Two passages, one about World War I and one about Stonehenge, were selected from Culture, a sixth grade social studies text published by Allyn and Bacon. Each passage was approximately 700

words in length. Three key words were selected from high in the content structure for each passage and were used as memory probes for free association (FA). Twenty multiple choice "wh" questions were prepared for each passage and these were used as the comprehension criterion.

Procedure

The subjects were divided into four experimental conditions:

Group 1 - Free Association, PReP, Free Association II, Text, Questions

Group 2 - Free Association I, Motivation, Free Association II, Text, Questions

Group 3 - Free Association I, Free Association II, Text, Questions

Group 4 - Distractor, Free Association II, Text, Questions

Each subject read both texts and text presentation was counterbalanced. The motivation activity consisted of the topical discussion teachers tend to conduct prior to the assignment of textbook reading. For group 4, an activity similar to PReP, taking an equal amount of time yet dealing with a topic which was not related to the textbook reading, was conducted in lieu of Free Association I. FAI and the distractor activity were administered three to five days before the PReP, motivation, second free association, text reading, and comprehension testing.

A review of the raw scores showed that group 4 (the distractor group) had a much narrower range and higher mean for reading achievement and IQ. An analysis of variance showed that this group was different from the other three conditions at the .001 level. There-

fore this group is not included in the analysis of treatment effects.

ANALYSIS AND FINDINGS

The free association responses were scored on a three point scale devised by Langer (1980), with 3 representing much prior knowledge and 1 representing little prior knowledge. Two judges scored the responses for each passage's three stimulus words separately. A subject's score for a particular passage was the average of the scores for all three stimulus words. Interrater agreement was relatively high (.86), and in cases of disagreement, an average of the two scores was computed. The comprehension criterion for each passage consisted of the raw score of total correct responses.

A correlation analysis (see Table 1) indicated that the prior knowledge levels elicited during free association were significantly related to "wh" comprehension ($p < .001$).

Insert Table 1 about here

An analysis of covariance controlling for the effects of IQ and reading achievement scores was performed to determine the effect of treatment condition on prior knowledge scores. Results indicate that the effect of treatment on free association scores was significant for both passages at $p < .01$ (see Table 2). A review of

Insert Table 2 about here

Table 2 indicates that most change is evident in condition 1 (PRP), some change in condition 2 (motivation), and a bit of negative change in condition 3 (no discussion at all).

An analysis of covariance was performed to determine the effect of treatment on the comprehension means. Findings (see Table 3)

Insert Table 3 about here

indicate that the means for both passages were higher in PReP than in the other conditions tested. However, this difference was not statistically significant. When reading achievement scores are used to separate subjects within condition into above, on, and below level, the on-level group shows treatment effects favoring PReP on FAII at the .001 level and in comprehension at the .05 level.

DISCUSSION

Findings indicate that the prior knowledge measure is a good predictor of "wh" comprehension (as well as the recall of content in a hierarchically organized manner). The PReP activity significantly raises the prior knowledge level, and may also have some generalized effect on comprehension. This is particularly evident for the on-level group where the opportunity to "think through" relevant knowledge has the most effect on comprehension. The above-level group was high to begin with and therefore the additional concept awareness probably could not substantially influence the already high scores. It is likely that the low group needed direct concept instruction as opposed to a refined concept awareness. Although the version of PReP used in this study did not deal with it, the PReP activity is part of a fuller procedure (Langer, 1980b) which helps teachers determine when such direct instruction is needed.

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Table 1

CORRELATION OF PREDICTORS WITH PASSAGE
COMPREHENSION

| Predictors | Passage Comprehension Scores | |
|---------------------------|------------------------------|------------|
| | WWI | Stonehenge |
| FAI | .61(117) | .40(114) |
| FAII | .59(159) | .47(156) |
| IQ | .43(130) | .38(128) |
| Reading Achievement Score | .46(138) | .50(135) |
| p < .001 | | |

Table 2

EFFECT OF PReP ON FAII MEANS

| | Free Assoc. PReP Free Assoc. | Free Assoc. Motivation Free Assoc. | Free Assoc. Free Assoc. | F test ¹ |
|------------|------------------------------------|--|----------------------------|---------------------|
| WWI | | | | |
| FAI | 1.13(35) | 1.14(29) | 1.16(24) | |
| FAII | 1.31(34) | 1.19(29) | 1.14(24) | |
| Change | .18(34) | .03(29) | -.01(24) | 7.05* |
| Stonehenge | | | | |
| FAI | 1.12(35) | 1.17(29) | 1.12(24) | |
| FAII | 1.21(35) | 1.19(29) | 1.10(24) | |
| Change | .09(35) | .02(29) | -.02(24) | 4.27* |

*p < .01

¹between group differences after controlling for effects of IQ and reading achievement score

Table 3

EFFECT OF PREP ON COMPREHENSION MEANS

| | Free Assoc. PREP Free Assoc. | Free Assoc. Motivation Free Assoc. | Free Assoc. Free Assoc. |
|------------|------------------------------------|--|----------------------------|
| WWI | | | |
| Comp. | 11.8(35) | 11.4(29) | 10.9(24) |
| Stonehenge | | | |
| Comp. | 11.5(35) | 11.3(29) | 11.0(22) |